UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/521,308	03/09/2000	Bruce A. Fairman	50N3545/1309	2383

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EXAMINER
BANANKHAH, MAJID A

ART UNIT	PAPER NUMBER
2127	

DATE MAILED: 02/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	09/521,308	FAIRMAN ET AL.
	Examiner	Art Unit
	Majid A Banankhah	2127

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>11 August 2003</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16,18-36 and 38-55* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16,18-36 and 38-55* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

1. This office action in response to paper numbers 14-15, RCE and Amendment C, which was

filed on August 11, 2003. Applicant's arguments concerning the rejection of claims have been

fully considered but they are not deemed to be persuasive. Claims 1-16, 18-36, 38-55 are

presented for examination. Applicant's argument has been fully considered, but they are moot in

view of the new ground of rejection.

In view of the Applicant's argument regarding Obviousness double patenting presented in

Amendment C, Paper Number 15, dated August 11, 2003, the rejection of claims under

obviousness double patenting is hereby withdrawn.

2. The text of those sections of Title 35, U.S. code not included in this office action can be found

in a prior Office action.

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –

> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claim 1, 21, 41, 42, and 43 are rejected under 35 U.S.C. 102(a) as being anticipated by

Culbert (U.S. Pat. No. 5,838,968, hereinafter Culbert).

The reference of Culbert teaches of:

A system for effectively utilizing resources in an electronic device *(See ABS., resource*

utilization, and col. 3, lines 28-33, The invention supports a mechanism for defining and

managing arbitrary resource through a task resource utilization vector), comprising: a resource

characterization coupled to said electronic device, said resource characterization corresponding

to a requested process, said resource characterization including resource requirements required

for executing said requested process *(When a task is operating using a specified task resource*

utilization record configuration, this is called the run level. Run levels can by symbolic, e.g.

optimal, optimal, next, minimal, or numeric, 1-n. This creates a matrix of run level, resource

requirements which resource manager 170 uses to globally optimize resource utilization

across all tasks. In the present embodiment, task resources associated with the current run level

are updated with actual resource usage measurements); an allocation manager configured to

authorize or deny said requested process by referencing said resource characterization *(col. 11,*

lines 46-51, In step 560, the resources recovered are compared against the deficit. If there are

now enough resources available, Query Result tells the tasks to set themselves to the specified

run levels computed in the optimal system utilization level, step 580, and the process executes

step 530 to allocation the resources. Otherwise in step 570, the request for additional resources

is denied.), said requested process executing with optimal performance when authorized by said

allocation manager *(See ABS., The system and method manage an arbitrary set of system*

resources and globally_optimize resource allocation across system tasks in a dynamic fashion,

according to a system specified performance model.), said optimal performance being due to

guaranteed preallocated resources provided by said electronic device *(In the present embodiment*

tasks have three classes, error intolerant, error-tolerant real-time, and non-real-time. To

guarantee proper functioning of error intolerant tasks, the resource manager must reserve

resources for the worst-case usage scenario of these tasks.); and a processor coupled to said

electronic device for controlling said allocation manager *(col. 6, lines 44-50, while resource*

manager 170 is responsible for creating and dynamically managing the resources available to

tasks. Tasks have a task structure commonly known in the art as a task control block that

contains the control information necessary for a task to run, be suspended and resumed, see also

Fig. 1, host processor 120) [emphasis added].

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness

rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

Claims 2-16, 18-20, 22-36, and 38-40, 44-55 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Culbert in view of Colby et al. (U.S. Pat. No. 6,625,643, hereinafter Colby),

further in view of Komuro (U.S. Pat. No. 6,223,285, hereinafter Komuro).

As per claims 2, and 22 the claim the reference of Culbert fails to teach of electronic

device is coupled to an electronic network, and that the electronic network is implemented

according to an IEEE Std 1394 serial bus interconnectivity standard. However, Colbert in the

same filed of endeavor teaches of as resource management on a data network, where the system

manages broadcast of data over the network and uses Internet to transmit and receive electronic

mail and network data and news *(See Colby Abs., Fig. 1, Fig. 4, and col. 3, lines 10-46)*, for the

reason to create access over the stream and managing broadcast events over a data network.

Therefore, it would have been obvious for one ordinary skill 8n the art at the time the invention

was made to implement the resource management device of Culbert into network environment of

Colby, for the reason to be able to manage broadcast events and be able to broadcast stream more

efficiently in the web environment.

Even though the IEE Std. 1394 serial bus is inherent in the Colby's reference (See, col. 1, lines

28-47), but he fails to explicitly teach of IEEE Std. 1394 serial bus, however, the Examiner is

citing the reference of Komuro in order to show that these features are notoriously well known in

the art, for the reason that information is transmitted in digital packets having certain header

information and having data sections *(See, Komuro, col. 1, lines 13-25)*.

Per claims 3, and 23 consumer electronic device and set top box is taught in *Komuro (See,*

Komuro, col. 1, lines 5, lines 5-16). The reference of Colby teaches of Internet for the use of

computer device.

Per claims 4, 24, and 44, wherein said requested process includes one or more time-sensitive

isochronous processes for manipulating time-critical isochronous data. The use of isochronous

data is taught by Komuro in col. 1, lines 25-43 *(AV data is transmitted such as movies)*.

Per claims 5, and 25 wherein said allocation manager compares said resource requirements to

current available resources, said allocation manager authorizing said requested process only

when said resource requirements are less than, or equal to, said current available resources,

Culbert teaches the limitation in col. 11, lines 46-51 *(In step 560, the resources recovered are*

*compared against the deficit. **If there are now enough resources available**, Query Result tells*

the tasks to set themselves to the specified run levels computed in the optimal system utilization

*level, step 580, **and the process executes step 530 to allocation the resources. Otherwise in step***

570, the request for additional resources is denied, and See ABS., The system and method

*manage an arbitrary set **of system resources and globally_optimize** resource allocation across*

*system tasks in a dynamic fashion, according to a **system specified performance model**).*

Per claims 6, and 26 wherein a software module generates a request to instantiate said requested

process on said electronic device, the reference of Culbert teaches of the limitation in Fig. 5,

teaches of a software program doing the comparison and request of the resources if there is need

for more resource.

Per claims 7, and 27 wherein said request includes an identifier that corresponds to said resource

characterization, the reference of Culbert teaches of the limitation in *(col. 11, lines 33-52, It is*

worth noting in that in the present embodiment, different run levels for tasks which are being

considered need not be monotonically decreasing in resource usage. Thus in one run level,

memory 100 use actually may increase in order to counteract decreases in other resources. If

*both memory 100 **use and CPU use are high**, then Query Result may chose complementary*

*resources. For instance, it may increase memory 100 access for one task **to reduce its CPU***

requirement**. It may reduce another task's memory 100 use at the expense of **increasing that

***task's CPU requirement**. By manipulating two or more variables in one or more task's resource*

usage, the resource manager 170 balances and solves the tasks' contention for resources).

Per claims 8, 28 wherein said allocation manager evaluates said resource characterization in

response to said request from said software module, the reference of Culbert teaches of

evaluating the resources in col. 8, lines 24-32 *"If task 350 cannot be allocated the resource*

specified in 310, task 350 could execute and perform its functions with the resource specified in

record 320 or 330. However, if the resource specified in record 330 are not available, then task

350 could not execute and perform its functions properly".

Per claims 9, and 29 wherein said resource characterization includes one or more resource

listings and one or more corresponding resource usage values that are required for an optimal

performance of said requested process. The reference of Culbert teaches of resource listing (Fig.

2, resource master list), usage value *(Fig. 2, resource indicator 220, Max units, 230, and current*

units 240). Additionally, he teaches of resource utilization record in col. 8, lines 24-32).

Per claims 10, and 30 wherein said resource characterization includes resource information

regarding total available resources from said electronic device, the reference of total available

resource in col. 6, lines 51-58 *(In order to perform its resource optimization functions, resource*

manager 170 maintains current allocation status information for each resource it manages. This

information is stored in a master list, which is periodically updated by resource manager 170).

Per claims 11, 31, and 45, wherein said allocation manager compares resource usage values

from said resource characterization and current available resource values from said electronic

device to determine whether to authorize said requested process, the reference of Culbert

teaches of the limitation in col. 11, lines 32-52 *(In step 560, the resources recovered are*

compared against the deficit. If there are now enough resources available, Query Result tells

the tasks to set themselves to the specified run levels computed in the optimal system utilization

level, step 580, and the process executes step 530 to allocation the resources. Otherwise in step

570, the request for additional resources is denied).

Per claims 12, 32, and 46, wherein said current available resource values are initially set to be

less than one-hundred percent of total device resources before any resource allocation is made,

the reference of Culbert teaches of the limitation in col. 8, lines 19-23 *(To guarantee proper*

functioning of error intolerant tasks, the resource manager must reserve resources for the worst-

case usage scenario of these tasks).

Per claims 13, 33 wherein said allocation manager authorizes said requested process whenever

said resource usage values from said resource characterization are less than or equal to said

current available resource values from said electronic device, Culbert teaches o the limitation in

Fig. 3, and Fig. 5 *(See 540, COMPUTE ACTUAL USAGE AND DETERMINE AVAILABLE*

RESOURCES).

Per claims 14, and 34 wherein said allocation manager denies said requested process whenever

said resource usage values from said resource characterization are greater than said current

available resource values from said electronic device, the reference of Culbert teaches of denying

of the request in col. 12, lines 64-68, continued on col. 13, lines 1-3 *(In step 660, the resources*

recovered are compared against the deficit. If there are now enough resources available, Query

Result tells the tasks to set themselves to the specified run levels computed in the optimal system

utilization level, step 680, and the process executes step 630 to allocation the resources.

Otherwise in step 670, the request for additional resources is denied).

Per claims 15, and 45 wherein said allocation manager updates said available resource values

with said resource usage values whenever said requested process is authorized by said allocation

manager, Culbert teaches of updating available resource values and usage values in col. 8, lines

47-60 *(The UpdateResourceMeasurements routine is activated by a timer on a periodic basis,*

and replaces the resource utilization record, at the current run level).

Per claims 16, and 46 wherein a picokernel in said electronic device instantiates and executes

said requested process after said allocation manager authorizes said requested process, Culbert

teaches of kernel processor instantiating and executing the resource request (Fig. 1, 120).

Per claims 18-19, 38-39 wherein said allocation manager sequentially references a plurality of

resource characterizations to handle a plurality of respective requested processes, and, wherein

said allocation manager references a plurality of resource characterizations to handle said

requested process, Culbert teaches of a plurality of resource characterization in Fig. 2, and Fig.3.

Per claims 20, and 40 wherein at least one of said resource characterization and said allocation

manager is re-configurable to provide an altered functionality to said electronic device, Culbert

teaches of the limitation in col. 8, lines 31-18 *(Additional records specify other resource*

utilization configurations. Resource utilization configurations may be in an order. The last

*record specifies the minimal resource **utilization configuration** indicating that a resource*

utilization configuration below this will cause the task to fail due to resource constraints).

Per claim 47, the reference of Culbert teaches of the limitation in col. 3, lines 61-68, continued

on col. 4, lines 1-3 *(Finally the invention provides for setting each of the tasks to the resource*

utilization record associated with the global system performance score which optimizes system

performance according to the specified system performance model. In the present invention the

system performance model takes into account the priorities of the tasks, the resource utilization

run level associated with the particular task and the priority of the task requests to determine the

allocation or deallocation of system resources).

Per claim 48, wherein said resource characterization is implemented as a two-dimensional array

of descriptive parameters that include one or more first parameters that each identifies a resource

type, said descriptive parameters also including one or more second parameters that each

specifies an amount of resource usage required for said resource type during said requested

isochronous process, Culbert teaches of the limitation in col. 6, lines 59-68, continued on col. 7,

lines 1-13 *(resource Entry 210 contains the Resource indicator, 220 which could be a name or*

an index, the maximum number of allocable units, 230, and the currently allocated units 240.

In the present embodiment, Resource include media engine CPU 20 utilization, PCI bus 40

utilization, memory 100 utilization, and memory bus 109 utilization, and host processor 120

utilization. However it should be noted that the list of the resource is not exhaustive. System

programmers may add their own resource as resource master list 200 is designed to be

expandable. Examples of other type of resource include special purpose hardware and other

input/output devices. The maximum number of allocable units is established by the hardware

configuration and set by the system at startup time).

Per claim 49, the type of resource managed by the system does not constitute a patentable

matter, however, the reference of Culbert teaches of the memory resource in col. 5, lines 49-65

(Memory 110 is a dynamic memory from which XOS 180 executes. XOS 180 and resource

manager 170 also use memory 110 to transfer data from devices and to store and access

communication subsystems implemented between XOS 180 and resource manager 170. In the

preferred embodiment, memory 110 is dynamic memory, a Rambus DRAM, but those skilled in

the art will recognize that other types of memory such as static memory would operate equally

well), and the references of Colby teaches of bandwidth requirement as resource in col. 1, lines

47-53, and Komuro teaches of other types of resources (See the abstract)

Per claim 50, wherein said resource characterization **includes one or more resource** usages that

specify said one or more resource requirements for said requested isochronous process, said

resource usages each being implemented as a ratio of a resource use amount for said requested

isochronous process per a given time period that includes a process scheduling overhead for

scheduling and instantiating said requested isochronous process with a picokernel program in

said electronic device, Culbert teaches of limitation in col. 6, lines 59-68, continued on col. 7,

lines 1-13 *(Referring to FIG. 2, Resource master list 200 is coupled to host processor 120 and*

resides in host memory 123, however in another embodiment resource master list 200 could be

located on memory 110, or in any other resource manager 170 accessible location. Resource

master List 200 holds the state of all resource managed by resource manager 170. For each

resource managed by resource manager 170, a resource entry 210 is created. Resource Entry

210 contains the resource indicator, 220 which could be a name or an index, the maximum

number of allocable units, 230, and the currently allocated units 240. In the present embodiment,

resources include media engine CPU 20 utilization, PCI bus 40 utilization, memory 100

utilization, and memory bus 109 utilization, and host processor 120 utilization. However it

should be noted that the list of resources is not exhaustive. System programmers may add their

own resource as resource master list 200 is designed to be expandable. Examples of other types

of resource include special purpose hardware and other input/output devices. The maximum

number of allocable units is established by the hardware configuration and set by the system at

startup time.)

Per claim 51, wherein said device software module generates an isochronous request to said

allocation manager for instantiating said requested isochronous process on said electronic device,

said isochronous request including a resource characterization identifier that corresponds to said

resource characterization, said allocation manager responsively evaluating said resource

characterization, in response to said isochronous request from said device software module, the

reference of Culbert teaches of the limitation in *(col. 11, lines 33-52, It is worth noting in that in*

the present embodiment, different run levels for tasks which are being considered need not be

monotonically decreasing in resource usage. Thus in one run level, memory 100 use actually

*may increase in order to counteract decreases in other resources. If both memory 100 **use and***

***CPU use are high**, then Query Result may chose complementary resources. For instance, it may*

*increase memory 100 access for one task **to reduce its CPU requirement**. It may reduce another*

*task's memory 100 use at the expense of **increasing that task's CPU requirement**. By*

manipulating two or more variables in one or more task's resource usage, the resource manager

170 balances and solves the tasks' contention for resources).

Per claim 52, wherein said allocation manager authorizes said requested isochronous process to

said device software module whenever resource usage values from said resource characterization

are less than or equal to said current available resources of said electronic device, said allocation

manager denying said requested isochronous process to said device software module whenever

said resource usage values from said resource characterization are greater than said current

available resources of said electronic device, Culbert teaches the limitation in col. 11, lines 46-51

(In step 560, the resources recovered are compared against the deficit. If there are now enough

resources available, Query Result tells the tasks to set themselves to the specified run levels

computed in the optimal system utilization level, step 580, and the process executes step 530 to

allocation the resources. Otherwise in step 570, the request for additional resources is denied,

and See ABS., The system and method manage an arbitrary set of system resources and globally

optimize resource allocation across system tasks in a dynamic fashion, according to a system

specified performance model).

Per claim 53, wherein said allocation manager generates a request fail signal to said device

software module whenever said requested isochronous process is denied, the reference of Colby

teaches of status message and sending error when the request is denied in col. 7, lines 31-40,

(The Topology Manager tracks the operation of any manager that it has assigned resources. It

will receive and track the status fields of `HereIAm` messages from each of these managers. If a

manager fails to send a `HearIAm` message before the assigned time out period or if the

received `HearIAm` message has the status field indicating an operation error, Topology

Manager will request resources from other managers and assign them to the event where it can.

It will mark the previous resources as out-of-service until it receives a clear status from the

manager of the resources).

Per claim 54, wherein said allocation manager performs an available resource update procedure

for updating said current available resources whenever said requested isochronous process is

authorized by said allocation manager, said available resource update procedure reducing said

current available resources by said one or more resource requirements for said requested

isochronous process, Culbert teaches of updating available resource values and usage values in

col. 8, lines 47-60 *(The UpdateResourceMeasurements routine is activated by a timer on a*

periodic basis, and replaces the resource utilization record, at the current run level).

Per claim 55, wherein said electronic device is coupled to an electronic network for receiving

and transmitting isochronous data corresponding to said requested isochronous process, said one

or more resource requirements in said resource characterization including one or more network

resource requirements for other electronic entities in said electronic network, the reference of

Colbert teaches of as resource management on a data network, where the system manages

broadcast of data over the network and uses Internet to transmit and receive electronic mail and

network data and news *(See Colby Abs., Fig.1, Fig.4, and col. 3, lines 10-46)*, for the reason to

create access over the stream and managing broadcast events over a data network.

5. The prior art made of record and not relied upon is considered pertinent to applicant's
disclosure.

6. Any inquiry concerning this communication or earlier communications from the examiner

should be directed to Maid A. Banankhah whose voice telephone number is (703) 308-6903. A

voice mail service is also available at this number. All response sent to U-S. Mail should be

mailed to: Commissioner of Patent and Trademarks Washington, D.C. 20231

Hand-delivered responses should be brought to Crystal Park Two, 2021 Crystal Drive, Arlington.

VA, Six Floor (Receptionist). All hand-delivered responses will be handled and entered by the

docketing personnel. Please do not hand deliver responses to the Examiner.

All Formal or Official Faxes must be signed and sent to either (703) 308-9051 or (703)

308-9052. Official faxes will be handled and entered by the docketing personnel. The date of

entry will correspond to the actual. FAX reception date unless that date is a Saturday, Sunday, or

a Federal Holiday within the District of Columbia, in which case the official date of receipt will

be the next business day. The application file will be promptly forwarded to the Examiner unless

the application file must be sent to another area of the office, e.g., finance Division for fee

charging, etc.

Majid A. Banankhah

Primary Patent Examiner,   MAJID BANANKHAH
Technology Center 2100,   PRIMARY EXAMINER
Computer security, architecture, and software